Optimal regulatory model for telecommunications services in the EU

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Optimal regulatory model for telecommunications services in the EU

STUDY for the IMCO Committee

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2017

DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

Optimal Regulatory Model for Telecommunications Services in the EU

STUDY

Abstract
This Study reviews the market trends for the development of digital networks and applications for 2020 and beyond and, on that basis, proposes a framework for an optimal regulation for telecommunications services in the European Union. Against that framework, the Study then critically assesses the draft European Electronic Communications Code proposed by the Commission in September 2016. The authors submit that the Commission's proposal goes in the right direction but in not ambitious enough to protect the EU consumers in the App economy and to stimulate the digital single market. Universal service should ensure an extensive availability of Wi-Fi connections throughout the EU and that citizens need to be protected by general consumer protection rules that are smarter and better enforced instead of detailed and complicated sector-specific rules. This publication was prepared at the request of Policy Department A for the IMCO Committee.

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LIST OF ABBREVIATIONS

ADRD	Alternative Dispute Resolution Directive
AR	Augmented Reality
BEREC	Body of European Regulatory Authorities
CAGR	Compound Annual Growth Rate
CRD	Consumer Rights Directive
EECC	European Electronic Communications Code
ECN	Electronic Communications Networks
ECS	Electronic Communications Services
EECC	European Electronic Communications Code
IAS	Internet Access Services
ICS	Interpersonnal Communications services
IOT	Internet of Things
M2M	Machine-to-Machine
NRA	National Regulatory Authorities
OIR	Open Internet Regulation
OTT	Over The Top services
UCPD	Unfair Commercial Practice Directive
UCTD	Unfair Contract Terms Directive
USO	Universal Service Obligations
VHC	Very High Capacity
VR	Virtual Reality

EXECUTIVE SUMMARY

KEY FINDINGS

Telecom trends towards 2030

- The use of digital applications will continue to grow rapidly in the future. On residential markets, the fastest growth may come from time-delayed TV services, mobile location services and m-commerce.
- This growth of application and the use of video will be translated in growth in IP traffic at a compound annual growth rate in the range of 20-25%.
- In turn, this growth in IP traffic will continue to increase the connectivity needs.

Optimal regulatory model

- Given the positive feedback loops between the deployment of new or upgraded digital networks and the diffusion of digital applications, an optimal regulation should be holistic and support digital demand as well as digital supply.
- Regarding digital networks, the policy priority is to ensure deployment of new and upgraded networks capable of meeting the connectivity needs required by the new digital applications. Regarding digital services, the priority is to stimulate the development and then the scale up of Internet applications with the removal of cross-borders barriers.
- The optimal governance framework is different for the regulation of digital networks and digital services because of their different characteristics: networks are localised and cannot be traded across borders while services can be traded between the Member States. The regulation of digital networks should be based on a strengthened open method of coordination with possibility of Commission binding intervention when needed. The regulation of digital services should be based on a strict application of the home country control and a full harmonisation of the main rules protecting public interest with effective and harmonised enforcement of those rules by strong and independent national agencies.

Regulation of networks and spectrum

- Given the trends in the use of digital applications and the duration of investment cycle in network deployment, ambitious connectivity targets are justified provided they remain technologically neutral.
- Those ambitious goals could only be met with ambitious reforms of access regulation as well as national and EU financing of new or upgraded networks.
- Spectrum assignment, while remaining a national competence, should be better coordinated at the EU level and made more coherent with other regulatory interventions.

Internet access services and universal service

- In the Internet age, universal service should focus on affordable broadband connections allowing access to the indispensable e-services (such as email, telephony and video, social network, online news, ecommerce site and e-gov

services). In an app economy, universal service should maximise the availability and the affordability of Wi-Fi connections.
- Users of Internet access service need to be protected given the importance of a service which is the door to the Information society and the often little competition for its provision. This can be achieved with general consumer protection rules which are smarter and better enforced complemented with the net neutrality EU rules adopted in 2015 with the Open Internet Regulation.

Interpersonal communications services

- Traditional telecommunications services are not (any more) so special and do not require any more extensive sector-specific consumer protection rules. The use of communications OTTs is rapidly growing in the EU indicating consumers' satisfaction. They should not be subject to legacy rules that were justified at the time of traditional telephony but not today. Moreover, the use of telephone numbers justify additional obligations.
- Telecommunications services are global by nature and are instrumental in building the digital single market. Hence, regulatory fragmentation and the application of 28 regulatory frameworks should be avoided.
- In the context of the current review of the EU consumer acquis, rules should be made smarter by better taking into account the numerous consumers' biases and by better integrating consumer protection directly into the computer code ('consumer protection by design').
- Moreover, those general rules should be better enforced at the national level by strengthening the resources and the power of sanction of the consumer protection agencies.

1. TELECOMS TRENDS TOWARDS 2030

KEY FINDINGS

- The use of digital applications will continue to grow rapidly in the future. On residential markets, the fastest growth may come from time-delayed TV services, mobile location services and m-commerce.
- This growth of application and the use of video will be translated in growth in IP traffic at a compound annual growth rate in the range of 20-25%.
- In turn, this growth in IP traffic will continue to increase the connectivity needs.

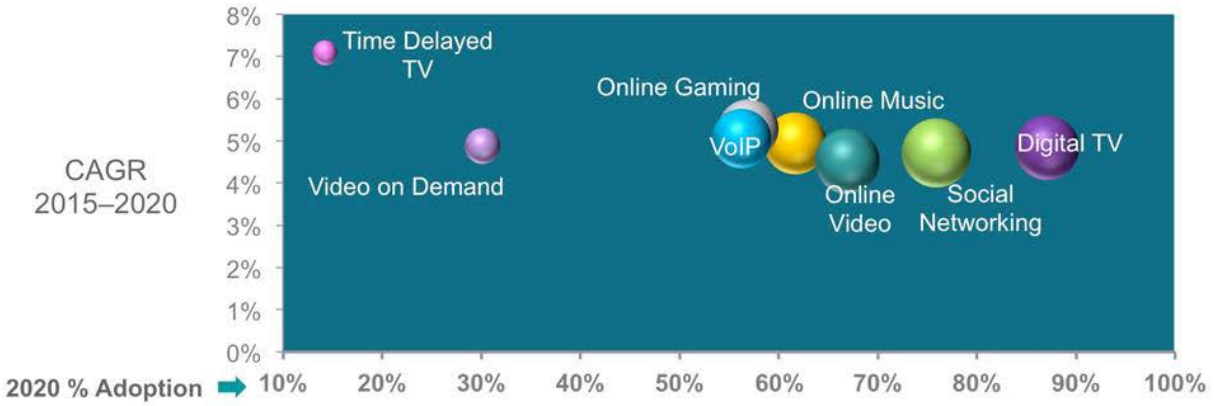
Although it is difficult to make predictions for the digital economy which is facing many disruptive changes, some trends can be clearly identified: more connections, fuelled by the Internet of Things and the connected devices and more applications leading to more traffic, in particular video requiring more connectivity.

1.1. Trends regarding Internet connections and applications

1.1.1. Residential markets

On the residential markets, Cisco[1] predicts that digital TV and social networking will be the two services with the highest penetration rates by 2020 and that the fastest growth will come from time-delayed TV services such as personal video recorder (PVR) and digital video recorder (DVR) services.

Figure 1: Global Residential Services Adoption and Growth

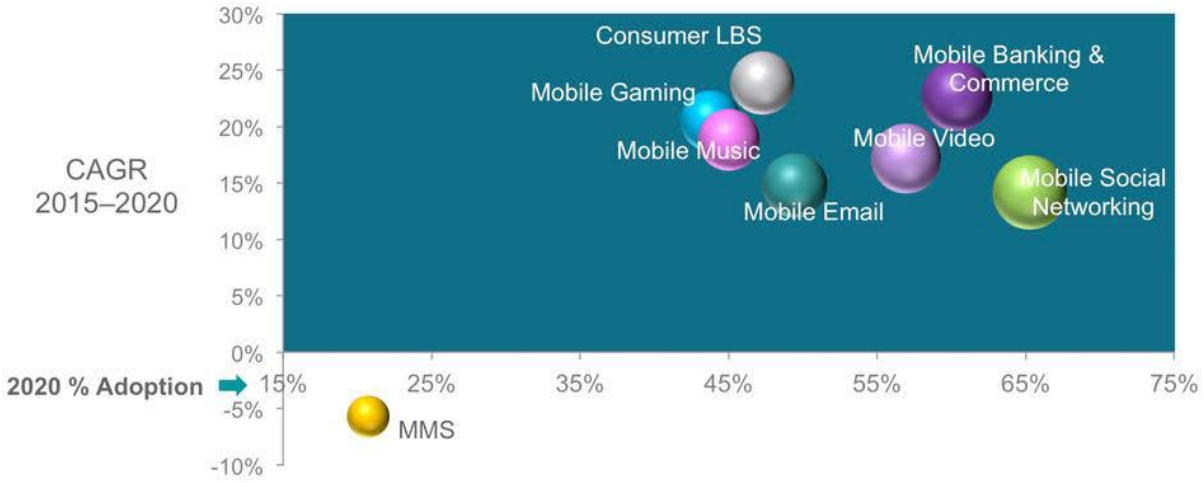


Source: Cisco (2016, p.13)

Focusing in particular on mobile services, Cisco predicts that the fastest growth will be in consumer location-based services (LBS) and mobile commerce.

[1] CISCO Visual Networking Index (2016), *The Zettabyte Era: Trends and Analysis*, White Paper, p. 12.

Figure 2: Global Consumer Mobile Services Adoption and Growth

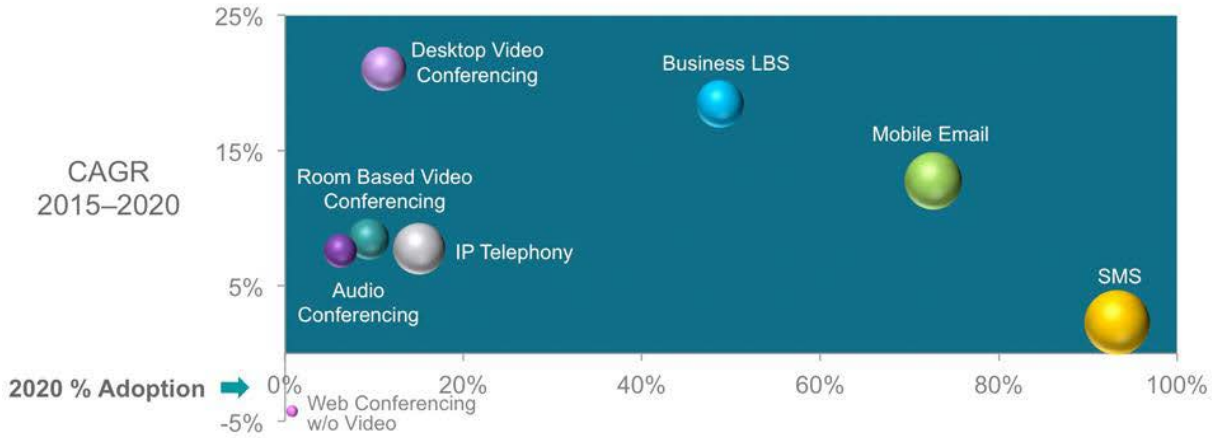


Source: Cisco (2016, p. 14)

1.1.2. Business markets

On the business markets, Cisco[2] predicts the fastest growth for desktop and personal video conferencing, mainly because of its higher quality and lower prices.

Figure 3: Global Business Services Adoption and Growth



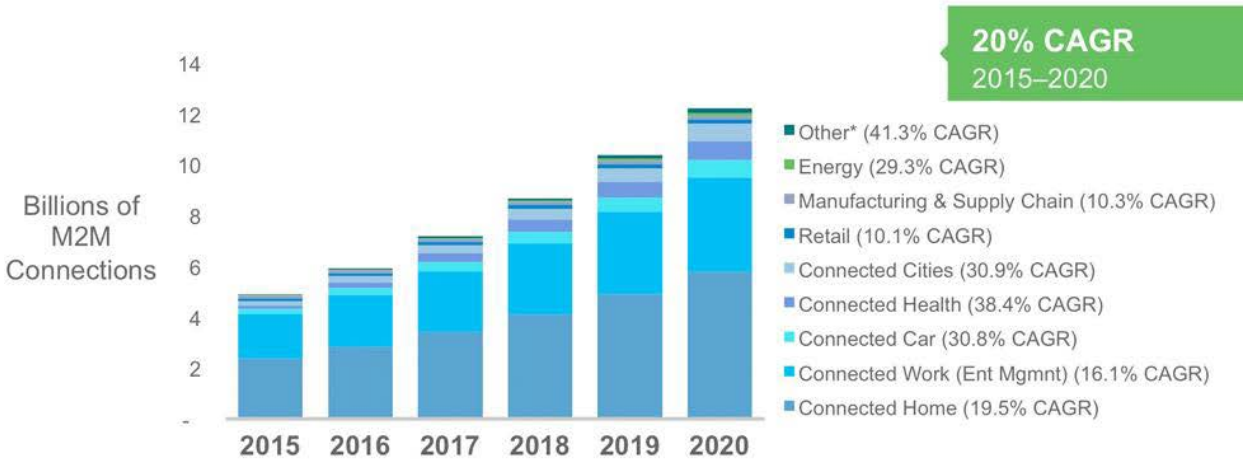
Source: Cisco (2016, p. 15)

1.1.3. M2M Applications

According to Cisco, connected home application such as home automation, home security and video surveillance, connected white goods, and tracking applications, will represent nearly half of the total M2M connections by 2020. Connected healthcare, with applications such as health monitors, medicine dispensers, first-responder connectivity, and telemedicine, will be the fastest-growing industry segment.

[2] CISCO Visual Networking Index (2016), *The Zettabyte Era: Trends and Analysis*, White Paper, p. 15.

Figure 4: Global M2M Connection Growth by Industries



Source: Cisco (2016, p. 11)

The rise of M2M applications will lead to massive deployment of ultra-narrowband Low-Power Wide-Area (LPWA) connectivity as M2M applications require low bandwidth and wide geographic coverage.

1.1.4. Virtual and Augmented Reality

According to Cisco,[3] Virtual Reality (VR) headsets will grow from an installed base of 18 million in 2016 to nearly a 100 million by 2021, a growth of 40 percent CAGR. Augmented Reality (AR) and VR market development are expected to follow a similar trend. While gaming is one of the key applications driving VR, AR is primarily been driven by industrial applications such as retail, medicine, education, tourism, retail shopping (furniture, clothes comparison, etc.).

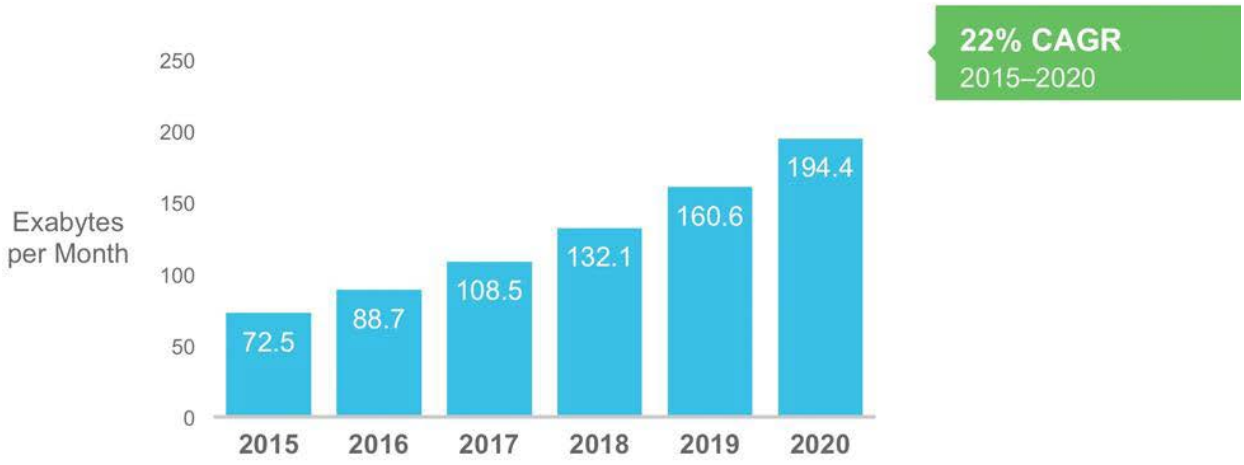
All these innovations in AR and VR will place new demands on the network in terms of its quality and performance. Bandwidth and latency requirements will become increasingly imperative for a high quality VR and AR experience. Globally, Virtual Reality traffic will grow 11 fold from 13.3 Petabytes per month in 2016, to 140 Petabytes per month in 2021 (Cisco, 2017, p.23).

1.2. Trends regarding the IP traffic

The important growth of Internet applications in the consumer and the business markets will continue to fuel the growth of IP traffic. According to Cisco (2016), the global IP traffic is expected to grow at the 22% GAGR until 2020 to end up with a 194 EB per month. Annual growth of global IP traffic growth is stabilising in the 20-25% range. A break-up of this trend by type of traffic, segment of customer and geographical area is available in Annex 1 of this report. The compound annual growth rate (CAGR) of IP traffic for 2015-2020 is predicted to be 20% for Western Europe and 27% for Central and Eastern Europe.

[3] CISCO Visual Networking Index (2017), *Global Mobile Data Traffic Forecast: Update 2016-2021*, White Paper.

Figure 5: Cisco VNI Forecasts for global IP Traffic



Source: Cisco (2016, p. 4)

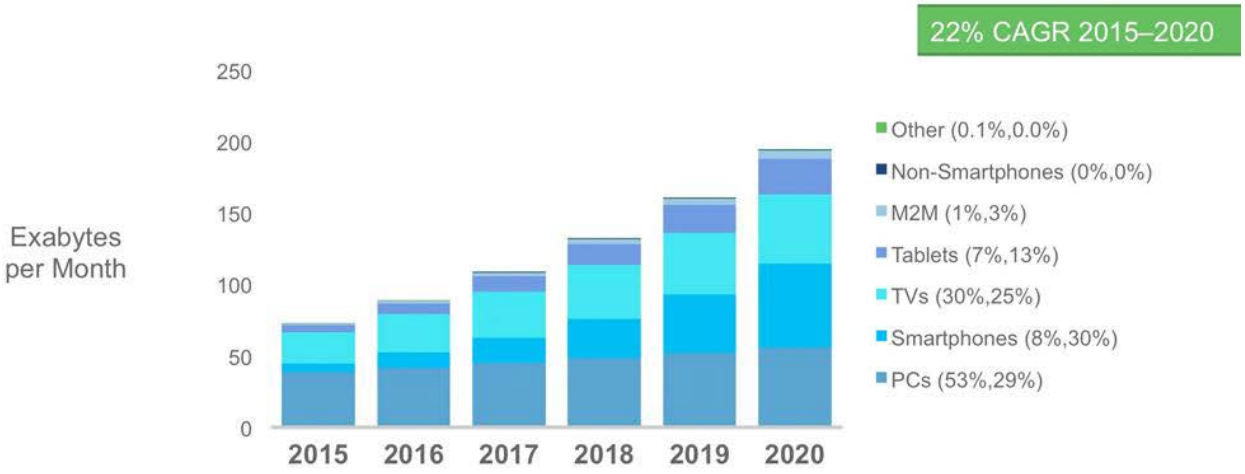
When IP traffic is broken down by application, video is by far the application which is the most important one today and such pre-eminence will increase in the future. Cisco notes that most forms of Internet video do not have a large upstream component. Therefore, traffic is not becoming more symmetric contrary to the expectations raised when user-generated content first became popular.

Figure 6: Global IP Traffic by Application Category

Source: Cisco (2016, p. 15)

When the IP traffic is broken down by devices, the main trend is the substitution of the PCs by the smartphones as the main driver of traffic growth.

Figure 7: Global IP Traffic by Devices

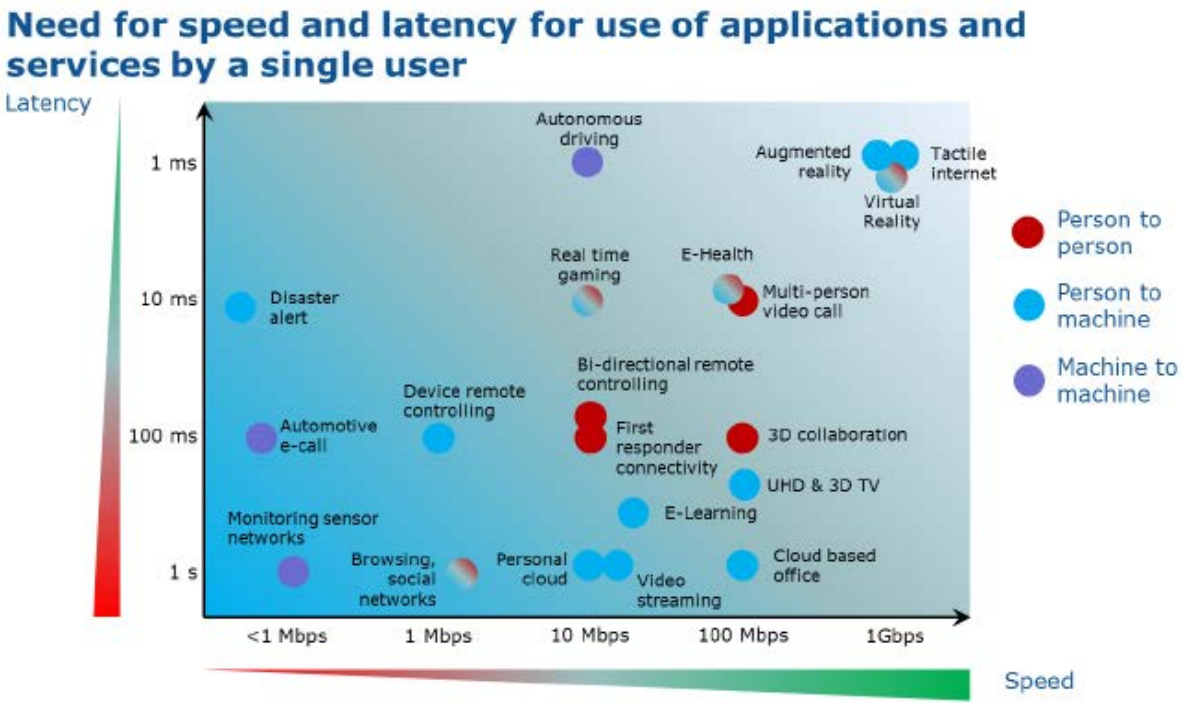


Source: Cisco (2016, p. 6)

1.3. Trends regarding connectivity requirement

As noted by the European Commission, new Internet applications will require higher speed, sometimes bi-directional, and low latency. For instance, new applications such as autonomous driving, or VR and AR application requires very low latency.

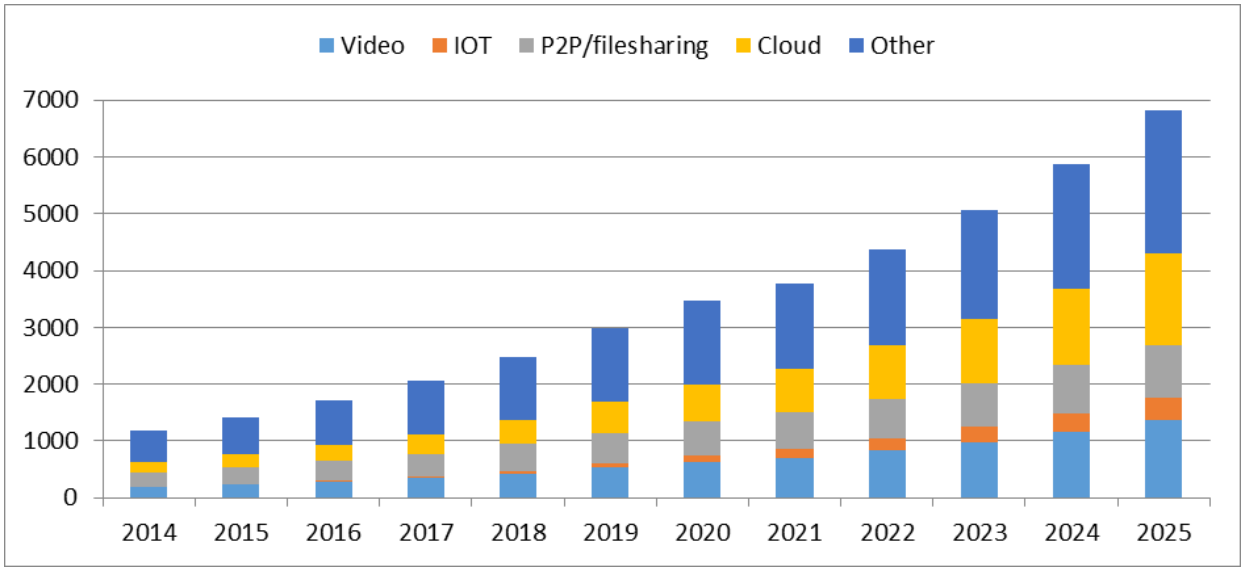
Figure 8: Applications' bandwidth and latency requirement



Source: European Commission based on GSMA and EIB

By extrapolating from past trends and the expected scope for further growth in key digital service areas, WIK-Deloitte and IDATE[4] have projected that fixed downstream traffic in the EU28 could increase by a factor of more than 7.5 between 2014 and 2025. The projected increases are driven to a large extent by video, which could see its share in total downstream traffic increase from 53% in 2014 to 68% in 2025, reflecting similar developments which have already occurred in the US.

Figure 9: Fixed upstream traffic (EU28, petabytes / month)



Source: WIK-Deloitte-IDATE (2016, p. 70)

On that basis, WIK-Deloitte and IDATE[5] anticipate that downstream traffic in the EU28 per connection will increase from 50GB/month to 298GB/month over the 2014-2025 period, which is much lower than the status quo predictions for the US, Canada or Japan as shown in Table 1.

Table 1: Evolution of fixed downstream traffic per geography (GB / fixed broadband line / month)

Country	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
EU28	50,2	60,2	71,8	85,8	102,7	122,9	142,5	165,2	191,5	221,9	257,1	298,0
US	96,0	115,2	139,2	168,4	204,3	247,3	288,0	336,6	389,8	448,8	513,9	586,8
CA	67,4	80,3	98,6	123,3	153,7	194,4	233,3	276,7	328,2	385,0	447,6	553,8
JP	30,5	40,8	54,5	72,8	97,1	129,2	158,4	196,1	239,9	296,4	362,3	447,5
AU	44,9	51,8	62,3	72,6	89,7	111,7	131,6	144,0	168,3	192,5	220,3	252,2

Source: WIK-Deloitte-IDATE (2016, p. 71)

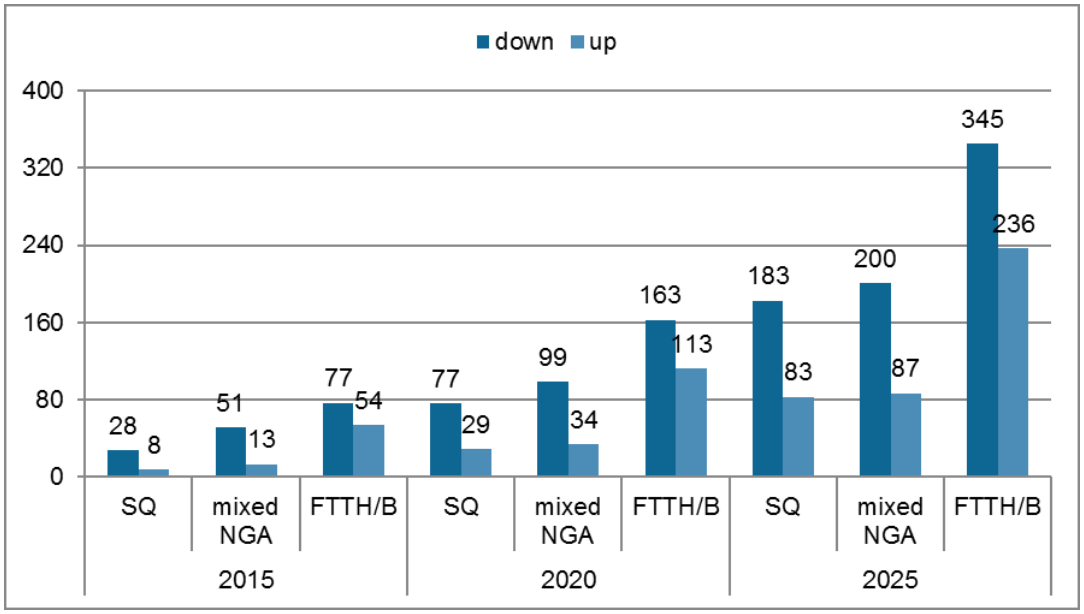
Those evolution assume a continuation of the current trends as regards NGA deployment and take-up as well as bandwidth usage. However, demand for connectivity is not independent from the connectivity supply and the capacity of the network.

[4] WIK-Consult, Deloitte and IDATE (2016), *Regulatory, in particular access, regimes for network investment models in Europe*, Study for the European Commission, p. 69.
[5] WIK-Consult, Deloitte and IDATE (2016), *Regulatory, in particular access, regimes for network investment models in Europe*, Study for the European Commission, p. 70.

Therefore, WIK-Deloitte-IDATE forecast demand for connectivity according to three different scenarios of network supply. They found the following results:

- Even in a status quo scenario the average bandwidth per connection will increase significantly. Downstream speeds will increase from 28 to 183Mbps while upstream speeds will increase more than eleven fold from 8 to 83 Mbps by 2025;
- In a 'mixed NGA' scenario, average bandwidth would rise from 51 to 200 Mbps downstream and from 13 to 87 Mbps upstream;
- In the all-FTTH/B setting connection speeds would rise to 345Mbps downstream in 2025, up from 77 Mbps in 2015. In terms of upstream bandwidth, the average is expected to reach 236Mbps in 2025, compared to 54 Mbps in 2015 for this scenario.

Figure 10: Average connection speed per scenario (Mbit/s EU28)

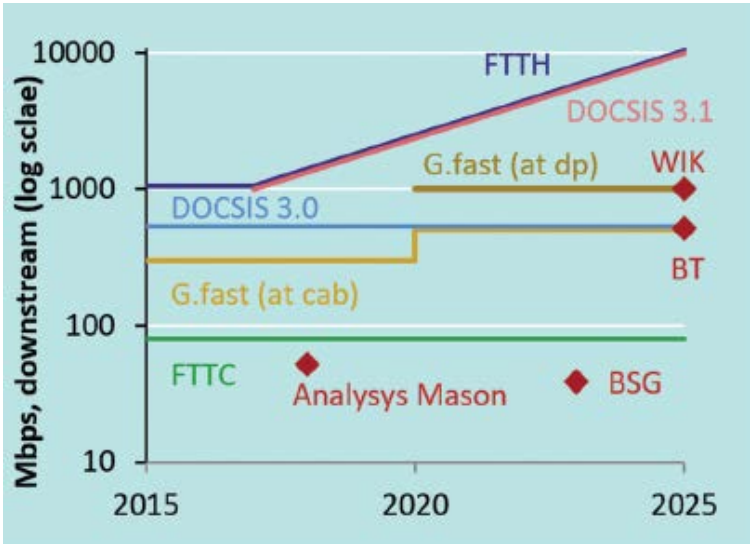


Source: WIK-Deloitte-IDATE (2016, p. 75)

Kenny and Williamson[6] have summarised the recent studies forecasting domestic bandwidth and the capabilities of the main technologies.

[6] Kenny R. and Williamson B. (2016), *Connectivity for the Gigabit Society*, Liberty Global Policy Series.

Figure 11: Forecast domestic bandwidth needs (demanding users) and access link capabilities



Source: Kenny and Williamson (2016, p. 25)

The most ambitious studies, done by WIK-Deloitte and IDATE (2016) and by BT (2015), forecasts, under some circumstances, a need of 1 Gbits in 2025. Other less ambitious studies, such as the report done for the Broadband Stakeholders Group by Kenny and Broughton (2013), forecast only a need of 100 Mbits in 2025.

Interestingly, Kenny and Williamson show that an upgrade of the current technologies, mainly G.fast for copper and DOCSIS 3.1 for cable, could meet the most ambitious forecast needs. However, WIK-Deloitte-IDATE consider that the upgrade of the current technologies may not be sufficient to meet the more ambitious forecasts, hence the deployment of FTTH may be required.

2. OPTIMAL REGULATORY MODEL[7]

KEY FINDINGS

- Given the positive feedback loops between the deployment of new or upgraded digital networks and the diffusion of digital applications, an optimal regulation should be holistic and support digital demand as well as digital supply.
- Regarding digital networks, the policy priority is to ensure deployment of new and upgraded networks capable of meeting the connectivity needs required by the new digital applications. Regarding digital services, the priority is to stimulate the development and then the scale up of Internet applications with the removal of cross-borders barriers.
- The optimal governance framework is different for the regulation of digital networks and digital services because of their different characteristics: networks are localised and cannot be traded across borders while services can be traded between the Member States. The regulation of digital networks should be based on a strengthened open method of coordination with possibility of Commission binding intervention when needed. The regulation of digital services should be based on a strict application of the home country control and a full harmonisation of the main rules protecting public interest with effective and harmonised enforcement of those rules by strong and independent national agencies.

To reap the full benefit of the digital economy, the EU needs to adopt rules which stimulate the deployment of networks able to support and meet the requirement of the new digital applications as well as the diffusion of those applications across the internal market. According to the Commission Better Regulation Guidelines,[8] those rules need to be:

- effective and meet those objectives,
- efficient in meeting those objectives,
- coherent between each other and with other EU rules,
- and relevant.

2.1. Need of a holistic approach

As the deployment of the digital networks and the diffusion of the digital applications are linked with and feed each other, the **EU decision makers should adopt a holistic approach dealing in a coherent manner with the regulation of the digital networks and services**.

This is the approach followed by the Commission in its Digital Single Market Strategy adopted in May 2015[9] with its three pillars: (1) ensure better access to digital goods and services, (2) guarantee right conditions for digital networks and services to flourish, (3) and maximise growth potential of the digital economy.

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[7] This section is partly based on A. de Streel and P. Larouche (2016), *An Integrated Regulatory Framework for Digital Networks and Services*, CERRE Policy Report.

[8] Commission Better Regulation Guidelines of 19 May 2015, SWD (2015) 111. Also: P. Muller, Conlon G., Denvani S. and Benard C. (2013), *Performance-based Policy*, Study for the IMCO Committee.

[9] Communication from the Commission of 6 May 2015, *A Digital Single Market Strategy for Europe*, COM(2015) 192.

This is also the approach that the Commission follows in its Digital Economic and Society Index (DESI)[10] which monitors five main areas: (1) connectivity, (2) human capital and skills (3) use of Internet, (4) integration of digital technologies, and (5) digital public services.

However, holistic approach raises the risks of lack of prioritization, waste of political and financial capital and, ultimately, failure to meet objectives. Therefore, it is the **important to (1) first prioritize policy initiatives on the basis of their potential effects** which should be determined on the basis of a rigorous impact assessment and then (2) closely **monitor the implementation of those priorities** to determine whether they achieve their goals on the basis of a rigorous ex post assessment and adapt actions and priorities when needed.[11]

2.2. Priority actions

Determining priorities among the possible policy actions regarding the regulation of digital networks and services is very difficult as there is no sufficient quantitative data on the impact of the main policy actions in the impact assessments of the Commission or in the academic literature.[12]

Priories should be determined for network deployment, which is covered by the proposed EECC, and for application diffusion, which is only partially and marginally covered by the proposed EECC as the latter only deals with the communications applications but not the other applications.

2.2.1. Actions regarding digital networks

Regarding digital networks, the priority for the policy makers should be to **stimulate the deployment and the use of infrastructures capable of delivering the new digital applications and supporting the IP traffic they will generate**.[13] This priority is different than the one of 25 years ago when the first comprehensive telecom regulatory framework was adopted at the EU level. At the time, the main priority was to open to competition existing fixed (copper) infrastructure to increase market efficiency. Today, the priority is to stimulate the penetration and the take-up of new infrastructures ensuring that European citizens and firms could use, while being mobile and on the move, the new digital applications and reap their full economic and social benefits. This priority action means that the EU decision makers should ensure:

- that incentives of the private operators to invest in new and/or upgraded networks are maximised,
- that in the areas (mainly rural) where there is no business case for investment, the public authorities support investment in an efficient manner without crowding out private investment,
- and that citizens and firms should be able to enjoy an always-on access to those infrastructures in the most efficient and the least costly manner.

Those new infrastructures will combine fixed and mobile elements, in particular with 5G developments. According to the impact assessment of the Commission, the introduction of 5G capabilities could generate a benefits of €146.5 billion per year.[14] €95.9 billion will arise from first order benefits in the four verticals i.e. automotive, healthcare, transport and

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10 https://ec.europa.eu/digital-single-market/en/desi

11 As explained in details in P. Muller, Conlon G., Denvani S. and Benard C. (2013), *Performance-based Policy*, Study for the IMCO Committee.

12 When proposing the European Electronic Communications Code, the European Commission did a thorough and rigourous impact assessment (see SWD(2016) 303) which was supported by an external study (see WIK-Ecorys and VVA (2016). However, those were mainly assessing impact of different options for each policy actions rather the impact of priorities among policy options.

13 WIK-Consult, Ecorys and VVA Consulting (2016), *Support for the preparation of the impact assessment accompanying the review of the regulatory framework for e-communications*, Study for the European Commission.

14 Commission Impact assessment of the proposed EECC, SWD(2016) 303, p. 105.

utilities. Benefits are distributed across the four sectors between strategic (€32 bn) and operational (€12 bn) benefits arising to organisations within the verticals. Relatively high levels of benefits were also recognised for the consumers of goods and services (€24 bn) from the verticals. Another significant benefit (€10.5 bn) is the ability of 5G to address the digital divide and overcome difficulties in providing ubiquitous broadband connectivity in more rural areas where current fixed networks struggle to provide adequate service.

2.2.2. Actions regarding digital services

Regarding digital services, the priority for the policy makers should be to **stimulate the development and then the diffusion of public and private Internet applications across the internal market**. This priority implies to facilitate their financing at the beginning with more venture capital and then their scale up with a strengthening of the internal market for digital services. According to the European Commission, a fully functioning digital single market could generate an additional growth of €415 bn. As only some digital applications, namely the ones related to communications services, are covered by the proposed EECC, this report does not analyse in depth the actions necessary to stimulate digital applications.[15]

2.3. Governance framework

The achievement of those priority action requires an appropriate governance framework involving EU and National institutions. Given the different characteristics of the digital networks and services, the optimal governance framework is different for the regulation of networks and services.

2.3.1. Governance regarding the regulation of digital networks

Digital networks are mainly composed of physical infrastructures, such are cable under or over the streets or mobile antennae towers, which are localised. Thus, according the subsidiarity principle, regulation of digital networks should mainly take place at the national, or even infra-national, level. However, EU intervention is justified when there are spill-over effects between Member States,[16] which may be the case of spectrum for instance, or to ensure that national regulator meet their objectives in the most efficient way.

On that basis, we suggest the following **optimal governance framework for the regulation of digital networks which is based on a strengthened open method of coordination**:[17]

- Each Member State adopts national objectives for network connectivity penetration and take-up in 2025 on the basis of guidelines agreed at the EU level,
- Each national regulatory authority then regulates networks according to national circumstances in order to achieve the connectivity objectives in the most efficient manner,
- Each year, the progress towards those objectives are reviewed in a multi-lateral dialogue among the Member States and with the Commission. During this dialogue best-practices will be identified and apply where relevant,
- The European Commission has direct means for binding intervention when a regulatory decision creates significant spill-overs effects on other Member States or

[15] See A. Venestra et al. (2013), *Ubiquitous Development of the Digital Single Market*, Study for the IMCO Committee.

[16] On those spill-over effects in telecommunications, see A. de Streel and Ph. Defraigne (2011), "Where Should the European Union Intervene to Foster the Internal Market for eComs", *Communications & Strategies* 82, 63-84.

[17] The open method of coordination was developed in 2000 for the Lisbon Strategy and is now widely used for the coordination of national economic and social policies in the context of the European semester and the Europe 2020 Strategy: https://ec.europa.eu/info/strategy/european-semester_en

when the national authority, because of capture or otherwise, does not deliver on the national connectivity objectives in an efficient manner.

- Moreover, the Commission controls, under the State aids rules, the national public financing of network deployment, in particular to ensure it does not entail competitive distortion. The Commission may also allocate EU funds to co-finance network deployment.

2.3.2. Governance regarding the regulation of digital services

Digital services, which run over digital networks, can often be easily traded between Member States. As the experience of US or China shows, the market size is key in the scaling up of digital services firms (which is one of the main weakness of EU digital firms). Therefore, EU rules should facilitate the free movement of digital services within the internal market by removing trade barriers.

In particular, the **application of the country-of-origin (home country control)** as enshrined in the Treaty and some directives important for digital services such as the e-commerce directive[18] or the audio-visual media services directive,[19] should be **extended to all digital services**.

For that principle to be acceptable to Member States, it requires a **harmonisation of the rules protecting the main public interest as well as an effective implementation of those rules**. In turn, this requires strong and independent enforcement agencies as well as a close cooperation between them with an EU network to ensure a harmonised implementation.

[18] Directive 2000/31 of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce), OJ [2000] L 178/1.

[19] Directive 2010/13 of the European Parliament and of the Council of 10 March 2010 on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the provision of audiovisual media services (Audiovisual Media Services Directive), OJ [2010] L 95/1.

3. REGULATION OF NETWORKS AND SPECTRUM

KEY FINDINGS

- Given the trends in the use of digital applications and the duration of investment cycle in network deployment, ambitious connectivity targets are justified provided they remain technologically neutral.
- Those ambitious goals could only be met with ambitious reforms of access regulation as well as national and EU financing of new or upgraded networks.
- Spectrum assignment, while remaining a national competence, should be better coordinated at the EU level and made more coherent with other regulatory interventions.

3.1. Regulation to stimulate network deployment

3.1.1. Commission proposal

Regarding network deployment, the Commission sets ambitious connectivity objectives for 2025:

- Gigabit connectivity for all main socio-economic drivers such as schools, transport hubs and main providers of public services as well as digitally intensive enterprises;
- All urban areas and all major terrestrial transport paths to have uninterrupted 5G coverage;
- All European households, rural or urban, will have access to Internet connectivity offering a downlink of at least 100 Mbps, upgradable to Gigabit speed.

Regarding network regulation, the Commission does not propose fundamental change to the current rules but more an evolution to increase the incentives to invest in network deployment, in particular very high capacity (VHC) networks. Access regulation will continue to be based on operators having significant market power determined on the basis of competition law methodologies. However, the Commission proposes targeted changes to ensure adequate returns on new investments relative to risks and give Europe-wide predictability to the international investment community, while leaving adequate scope for adaptation to localised network conditions. For example, the Commission proposes to prioritise network access remedies that directly support competitive infrastructure deployment wherever feasible, and reflecting the retail choices already available to end-users. The Commission also proposes to expand the menu of remedies at the disposal of national regulatory authorities to ensure they can chose the remedies that better fit their national circumstances.

3.1.2. Critical assessment and Recommendations

a. Connectivity objectives

The Commission sets very ambitious connectivity objectives, in particular for the nascent 5G technology. Given the trends in application diffusion, connectivity needs will surely increase over time in Europe and given the long investment cycle for network deployment, **it is appropriate be ambitious**.

However, it is important that **those objectives remain technologically neutral** and allow the best and the most efficient technology mix to fulfil connectivity needs.[20]

[20] Also R. Kenny and B. Williamson (2016), *Connectivity for the Gigabit Society*, Liberty Global Policy Series.

Moreover to be effective, those EU objectives need to be translated into **national connectivity targets** and the progress towards those targets should be monitored regularly.

b. Regulatory actions and public financing to achieve connectivity objectives

Ambitious connectivity targets should be matched by ambitious regulatory and financing measures to achieve those targets.

Regarding regulation, the relationship between compulsory regulated access, competition - which may be on the same network (intra-network competition) or between networks (inter-networks competition) – and investment is complex and controversial. Some argue that more competition increases the risk of losing customers, hence increases the incentives to invest. Others argue that more competition decreases the margins which are necessary to invest, hence decreases incentives to invest. However, what is clear is that the priorities of today, network deployment, are not the same than the priorities of the past, hence regulators should pay more attention to network deployment and should be evaluated that basis.

According to us, the **relative modest changes to the access regulation proposed by the Commission go in the right direction but may not be enough to deliver the connectivity targets set for 2025**. Next to the strengthening of symmetric regulation and the additional emphasis on co-investment or wholesale only investment models, the Commission could have investigated and possibly proposed the option of exclusive licensing of fibre infrastructures which would be open to competing operators.[21]

Regarding financing, the Commission needs to **adapt the 2012 State Aid Broadband Guidelines** to ensure their coherence with the new connectivity objectives and with the proposed adaptations to the access regulation.

c. Governance framework to achieve those objectives

The increased flexibility given to the Member States in regulating their digital networks is welcome given the localised nature of such networks. However, this flexibility requires a strengthening of EU coordination between NRAs to ensure, on the one hand, that NRAs choose the most effective remedies to achieve connectivity objectives and, on the other hand, that these remedies do not delay the deployment of very high capacity networks.[22] **Thus, the increased flexibility in the substantive law should go hand in hand with an increase coordination between the NRAs**, in particular with the transformation of BEREC into a fully-fledged EU agency as proposed by the Commission.[23]

Moreover, a **more precise governance framework, based on a strengthened open method of coordination, should be set up** to ensure that each Member State adopt connectivity objectives able to meet the EU objectives and then they deliver on those national targets.

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[21] Richard Feasey, Competition for monopoly, 8 June 2015, available on: http://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxmZWFzZXl3YWxlc3xneDoxMzZjOWQ5Mzg0NTNkZDll asking "Why shouldn't the framework allow regulators to sanction the creation of de facto or de jure monopolies (…) the UK Government ran competitive tenders for licences which provided exclusive rights to offer cable TV services in numerous British cities in the 1990s. And of course spectrum licences in telecoms grant exclusive rights to individual firms for particular frequencies, allowing them to exclude rivals in the process."

[22] Markos Tselekounis e.a., Flexibility or certainty? A regulatory dilemma, Fourth Annual Conference On Competition And Regulation In Network Industries, 25 November 2011.

[23] WIK-Consult, Deloitte and IDATE (2016), *Regulatory, in particular access, regimes for network investment models in Europe*, Study for the European Commission, Chapter 13.

3.2. Better spectrum assignment

3.2.1. Commission proposal

Regarding spectrum assignment, the Commission proposes to strengthen the EU coordination and ensure more coherence with market regulation. The Commission proposes assignment deadlines and licence periods (for a minimum of 25 years) and a peer review among national regulators to ensure consistent assignment practices as well as a consistent approach to coverage obligations, to small cell deployment and to network sharing, with the goal to stimulate 5G deployment and rural connectivity.

3.2.2. Critical assessment and Recommendations

The **Commission proposals are very welcome** because the lack of coordination and coherence in spectrum assignment led to substantial delay in 4G deployment in Europe. As spectrum allocation and management is mainly a competence of the Member States, the Commission could hardly have made more detailed and intrusive proposals. The active role of Member States will be instrumental for the deployment of 5G. Setting common EU 5G broadband targets for 2025 is already going much further than the US approach[24].

In addition, Member States should facilitate **not only the authorization of small cells (with a general authorization regime), but also alleviate imposing too stringent Electromagnetic Field (EMF) rules** and pre-empt the proliferation of local taxes on small cell antennas.

[24] As formulated by the then FCC chairman Tom Wheeler on 20 June 2016: « *We will be repeating the proven formula that made the United States the world leader in 4G. It's a simple formula: Lead the world in spectrum availability, encourage and protect innovation-driving competition, and stay out of the way of technological development*." available on: http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db0620/DOC-339920A1.pdf

4. INTERNET ACCESS SERVICES AND UNIVERSAL SERVICE

KEY FINDINGS

- In the Internet age, universal service should focus on affordable broadband connections allowing access to the indispensable e-services (such as email, telephony and video, social network, online news, ecommerce site and e-gov services). In an app economy, universal service should maximise the availability and the affordability of Wi-Fi connections.
- Users of Internet access service need to be protected given the importance of a service which is the door to the Information society and the often little competition for its provision. This can be achieved with general consumer protection rules which are smarter and better enforced complemented with the net neutrality EU rules adopted in 2015 with the Open Internet Regulation.

One of the most important changes proposed by the Commission is the new categorization of electronic communications services that includes now explicitly the communications Over-the-Top (OTT) services (ECS) such as Skype, Viber or WhatsApp. As shown in Figure 12 and detailed in Annex 2 of this report, the Commission proposes to divide the ECS into four main categories:[25]

- the *Internet Access Service (IAS)* which covers the Internet connections offered by the Internet service providers via fixed or non-fixed technologies;

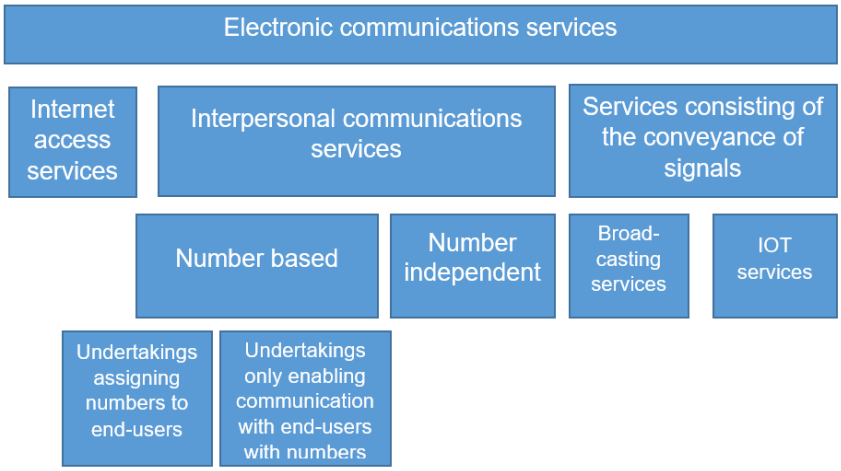
- the *number-based Interpersonal Communications Service (ICS)* which covers the traditional telecommunications services;

- the *number-independent Interpersonal Communications Service (ICS)* which covers the new communications OTT services such as Skype, WhatsApp or Viber;

- the *service consisting wholly or mainly of the conveyance of signals*, such as transmission services used for Machine-to-Machine (M2M) communications and for broadcasting.

[25] See proposed Article 2 EECC. Under the current regulatory framework, the status of OTT is not totally clear and most of them are not covered by the electronic communications rules: see BEREC (2016), *Report on OTT services*, BoR(16) 35.

Figure 12: The categories of electronic communications services



Those categories are important as they determine the obligations that the future EECC will impose on the providers of each respective category of services. The most extensive obligations apply to the providers of IAS and the number-based ICS, but some obligations also apply to number-independent ICS, often referred to as OTT (see *infra*, Table 3). This section deals with the Internet Access Service, which is the door to the information society and necessary to access most of the digital services, including the other ECS. The other ECS are dealt in section 5.

4.1. Universal service: the availability and accessibility of Internet access services

4.1.1. Proposal of the Commission

The Code aims to adapt universal service to the broadband Internet society and proposes the following main changes:

- USO should focus on affordability and not availability of Internet access. The availability, which is the most costly obligation as it requires network deployment, should be principally achieved by other means than USO such as private investment whose incentives should be maximised by regulation, or public investment with EU and/or national budget. It is only when those other means do not deliver availability that USO can be used;[26]

- USO is limited to Internet access and not any more to other legacy services of the telephony time; [27]

- The required Internet access is defined on the basis of a list of minimum services indispensable in the Information society such as email, search engines, social networks, e-gov services ….[28]

Moreover, the Commission proposes to remove the option for Member States to have the net cost of USO financed through a levy on operators.[29] Taking into account a broader range of beneficiaries (beyond the telecom sector) of universal broadband, the proposal relies on financing through the general budget as a more equitable and less distortive way of funding the provision of universal service.

[26] Proposed Articles 80-81 EECC.
[27] Proposed Article 79(1) EECC.
[28] Proposed Article 79(2) and Annex V EECC.
[29] Proposed Article 85 EECC.

4.1.2. Critical assessment and Recommendations

The proposal of the Commission goes in the right direction[30] in focusing the USO on Internet access service but needs some guidelines to frame the freedom left to the Member States in implementing USO according to their national circumstances and preferences. It is also not ambitious enough and not yet adapted to the app economy where citizens need to be connected outside their main residences. We examine those issues in turn.

a. Functional Internet access at a fixed location

Given the evolution towards all-IP and the increased competition on the communications services running over the top of an Internet connection, **it is appropriate to focus USO on Internet access and not on the other communications services** such as voice or directories. Moreover, given the importance of having access to some e-services, it is **appropriate to define the capability of the Internet connection as supporting those e-services**.

However, three issues need to be kept during the political negotiations and be clarified during those negotiations or afterwards with Commission guidelines.

First, the **functional Internet access, guaranteed by USO, should be defined in terms of data volume necessary to support the basic e-services and not in terms of speed**. This is important because today Internet Services Providers apply 'flat rate' pricing strategies, sometimes with unlimited data. Monthly prices depend not only of the maximum possible speed, but also of the amount of data included. A reasonable 'cap' can be determined on the basis of, on the one hand, usage statistics of the different services listed in Annex V EECC, where surveys are available, and, on the other, the data volume that this usage represents.[31]

According to the study done for the Commission by Tech4i et al. (2016), the bandwidth and data requirement for a so-called 'primary basket' of e-services[32] are the following.

Table 2: Minimum bandwidth and monthly data requirements

Download bandwidth requirement 2015	Download bandwidth requirement 2020	Monthly data requirement 2015	Monthly data requirement 2020
4 Mbps	9.6 Mbps	10 GB/month	26 GB/month

Source: Tech4i et al. (2016, p. 56)

The Commission proposal should either entrust the Commission to fix such cap(s) or require NRAs to do so, taking into account national specificities. In the absence of such clarification, the affordability requirement remains vague allowing inconsistent interpretations and implementation throughout the EU.

Second, **the obligation to finance USO with public funds and not with a sector fund should be maintained** in the adopted Code.[33] Several Member States are calling to keep the current financing flexibility and argue that they are best placed to decide which the best financing mechanism is. However, sector fund has several disadvantages:[34] (i) it may be

[30] While raising "some concerns about the potential market distortions and increased bureaucracy that might arise from expanding the affordability measures to include mobile services as well as to the practicalities of monitoring the situation of end users with respect to affordability", BEREC welcomes the approach. ((See High-level Opinion of December 2016 on the European Commission's proposals for a review of the electronic communications framework, BoR (16) 213, p. 3).

[31] https://www.broadbandchoices.co.uk/guides/broadband/guide-to-internet-data-usage

[32] This primary basket of e-services corresponds to the services that the Commission proposes to use to define the universal service connectivity.

[33] As currently proposed in Article 85 EECC.

[34] Tech4i2, Time.lex BV CVBA, Acreo and Genesis Media (2016), *Review of the scope of Universal Service*, Study for the European Commission, Chapter 12); and A. de Streel and P. Larouche (2016), *An Integrated Regulatory Framework for Digital Networks and Services*, CERRE Policy Report, p. 32.

costly to run; (ii) it is unfair as it forces the telecom sector to finance an infrastructure that benefits the whole society; (iii) and it is inefficient. Indeed, the economic literature[35] shows that, unless the national tax system is very distorted, public funds are more efficient and less distortive than sector funds to finance USO for many reasons: it increases the tax base, which in turn allows a reduction of the tax rate which then reduces the crowding-out effects of the taxes; it forces the State to internalise the effects of its decisions as the costs of any extension of the USO decided by the State is supported by the State itself and not the sector.[36]

Third, **the principle that USO is not an industrial policy tool to support network deployment should also be maintained** in the adopted Code.[37] During the political negotiation, some policy makers may see USO as a quick and easy way to finance network deployment, especially in the rural areas where the costs are the highest. If the USO can only be financed with public funds, as currently proposed, using USO for network deployment is not problematic and probably inevitable in some rural areas. However, if the USO could be financed by a sector fund, as it can be feared, then the sector may be forced to finance the potential huge network deployment costs.[38] This may even backfire as the heavy taxes on the sector may decease competition, which is one of the main tool to stimulate investment and network deployment.[39]

b. The list of services which the functional internet access shall be capable of

The Commission proposal requires the Member States to define the mandated universal functional internet access service in their territory. This access shall be capable of supporting the following minimum set of services:

- E-mail,
- search engines enabling search and finding of all type of information,
- basic training and education online tools,
- online newspapers/news,
- buying/ordering goods or services online,
- job searching and job searching tools,
- professional networking,
- internet banking,
- e-Government service use,
- social media and instant messaging,
- calls and video calls (standard quality).

A **missing element in the list is e-Health**. According to the Tech4i2 study,[40] benefits of combining broadband connectivity and health have emerged from chronic disease management; electronic health records; online health education; telemedicine; electronic patient records and secure messaging systems between health providers and the collection of information from wireless sensors in patients' homes will improve the management of chronic diseases and could reduce treatment costs by between 10 and 20%.

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35 European Commission – DG ECFIN (1999), *Liberalisation of Network Industries: Economic implications and main policy issues*, *European Economy*, 1999/4 and, J. Hausmann (1998), "Taxation by Telecommunications Regulation", in J. Poterba (ed), *Tax Policy and the Economy 12*, 29-48, NBER and MIT Press.

36 In the specific EU context, there is an additional internal market rationale because the operators active in the Member States where they have to pay important USO sector contributions suffer from a competitive disadvantage vis-à-vis the operators active in countries where is no such heavy financial burden.

37 As currently proposed in Article 81 EECC.

38 Depending of the e-services that the universal service connexions should be able to allow, the costs of network deployment has been estimated by Tech4i2, Time.lex BV CVBA, Acreo and Genesis Media (2016), *Review of the scope of Universal Service*, Study for the European Commission, chapter 8 between €6.8 and 46.9 billion in 2015 and between €13.7 and 143.8 billion in 2020.

39 A. de Streel and P. Larouche (2016), An Integrated Regulatory Framework for Digital Networks and Services, CERRE Policy Report, p. 30.

40 O.c. p. 52

c. The right to ubiquitous internet access

The Commission proposal aims to ensure an affordable access at only *one single* fixed location and focuses more on the speed of connections than on access everywhere. However, in the app economy, it is the connectivity reach and the possible to have an affordable access everywhere which is key.[41]

Such affordable always-on connectivity could not be achieved with the mobile connections only. At the national level, massive use of mobile connectivity could lead to congestion problems.[42] At the European level, the price of international data roaming make such connection expensive, even taking into account the price control that have been set.[43] It is therefore a mix of mobile and Wi-Fi connections that will ensure in an efficient manner an always-on connection within the Member States and across the internal market. In fact, the substantial majority of all traffic to smartphones and tablets (which we see as mobile devices) is already carried over Wi-Fi at home and at work (and thus over the fixed network). Today most of the Wi-Fi internet access still happens at the home. But this is not due to a consumer preference to access the internet at home, but rather on the limited availability of hot and home spots.[44] It is expected that globally, total public Wi-Fi hotspots (including homespots) will grow six-fold from 2016 to 2021, from 94.0 million in 2016 to 541.6 million by 2021. Total Wi-Fi homespots will grow from 85.1 million in 2016 to 526.2 million by 2021.[45] Commercial hotspots are a smaller subset of the overall public Wi-Fi hotspot forecast and will grow from 8.8 Million in 2016 to 15.3 Million by 2021.

It is therefore regrettable that the preparatory external studies as well as the Commission Impact assessment do not examine the option of imposing Wi-Fi access everywhere. The Commission only proposes, within the Connection Europe Facility, a simple financing mechanism of €120 million for the installation of local wireless access points where no freely accessible public or private access points delivering very high-speed broadband exist (the WiFI4EU proposal).[46]

To be more future-proof, the Code should maximise the availability of Wi-Fi connections in the public spaces managed by the State or even managed by private parties as well as via homespots networks.

- **Wi-Fi in public spaces managed by the State**: The co-legislators should investigate the possibility of requiring that all government entities managing public areas (such as railroad stations, public buildings, schools or public hospitals) provide

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41 Not being able to get online in the first place makes speed a moot point: "*Do people really care if a big file takes 20 minutes rather than 25 to arrive, when they can't get online at all?"*– As a matter of fact, most consumers connect to the internet via the domestic combined domestic Wi-Fi router and modem provided by their ISP. The router, once connected and switched on, is usually totally unmanaged by the ISP. If the router is only offering 1Mbps thanks to local Wi-Fi congestion or bad end user equipment reception, then no matter how much better the connection the ISP provides, the customer will only ever experience a 1Mbps connection. Most of the consumers do not complain as long the connectivity is not patchy.

42 As noted by the Study underlying the 2014 Recommendation on Relevant Markets, p. 57: "if LTE is massively used for IPTV services, customers will experience congestion problems during peak times such as an important football match between Germany and Italy. [However] in rural areas there are less mobile network users and people may rely more on terrestrial or satellite broadcasting. This makes the congestion problem less pronounced. In rural areas, LTE may be more of a substitute for fixed broadband than in urban areas."

43 However, it is doubtful that the amounts agreed for the wholesale data roaming rates gliding path will achieve the demand side objective. For example, by 2022 average mobile consumption will reach more than 12 GB per month, which would cost €30, much less than today but still prohibitive for many users.

44 In the Czech Republic, where hotspots were pervasively deployed, the regulator highlighted that Wi-Fi access was from the point of end users the second most widespread platform to gain internet access after xDSL and that Wi-Fi access represented a substitute particularly for the most price-sensitive customers, see Commission Decision of 10 August 2012 in Case CZ/2012/1322: Wholesale Broadband Access in the Czech Republic C(2012) 5654).

45 CISCO p. 20

46 Commission Proposal of 14 September 2016 for a regulation of the European Parliament and of the Council amending Regulations 1316/2013 and 283/2014 as regards the promotion of Internet connectivity in local communities, COM(2016) 589.

free Wi-Fi access. In most cases, these public bodies already have broadband subscriptions and the Wi-Fi obligation would only lead to an increase in communication costs, which is likely to be limited taking into account the decreasing cost of bandwidth resulting from the deployment of high speed fibre (based) networks.

- **Wi-Fi in public spaces managed by private persons**: The co-legislators should also investigate the possibility to impose Wi-Fi availabilities to private parties making public areas accessible such as shops, hotels and restaurants. Imposing obligations on private persons may imply legal challenges in some Member States. However, this has already been done in other public policy areas, for example for the prohibition of smoking in public places.[47] In addition, the costs of this Wi-Fi obligation can be maintained significantly below the public benefits of increasing internet access. As it is the case for publicly institutions, the concerned private entities and physical persons already have broadband connections, so that the measure would only lead to a marginal increase in usage cost and private persons would commercially benefit from the obligation. Member States could also subsidize part of the cost of installation in addition to the Connection Europe Facility budget earmarked for WIFI4EU. Moreover, as advocated in reply[48] to the public consultation on the evaluation and the review of the regulatory framework for electronic communications, an EU wide safe harbour[49] could be introduced for the providers of these Wi-Fi hotspots.

- **Wi-Fi via homespot networks***:* Today, the main EU ISPs are increasingly providing out-of-home Wi-Fi coverage to their customers via the sharing of their customers' homespots with their other subscribers.[50] Public home spots make use of the routers (hubs) installed in their private customers' living rooms, halls and studies. Given that the public home spot takes minimal bandwidth (and always gives way to the private usage) and that the hubs are widely spread even in relatively low population density areas, it is an efficient, low-cost, low-energy way to provide on-line access to huge areas and huge numbers of people.[51]

Over a number of years, these measures would lead to a Wi-Fi internet access nearly anywhere anytime in the EU in favour of broadband subscribers, and in particular for those with universal service internet access contracts. **These obligations should be reviewed once 5G networks become ubiquitous** because then the connectivity offered by 5G network could meet the requirement for an affordable and always-on connectivity.[52] Moreover, as 5G is being introduced, plans will be generous with data caps and speeds will

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47 Council recommendation of 30 November 2009 on smoke-free environment, O.J. C 296/4 of 5.12.2009

48 According to the synthesis report on the public consultation on the evaluation and review of the regulatory framework for electronic communications, 20 April 2016, integrated into the Impact Assessment, SWD(2016) 303 final, Part 2/3, p.15.

49 In the wake of the Judgment of the Court of 15 September 2016 (Case C-484/14, *Tobias Mc Fadden v Sony Music Entertainment Germany GmbH*, ECLI:EU:C:2016:689) an amendment to Article 12 of the Directive 2000/31 ('Directive on electronic commerce') may be appropriate. The amendment would clarify that the providers of these universal service Wi-Fi hotspots would bear no liability as long as they make access subject to a password that can obtained by the visitor of their premises or a preliminary registration (or equivalent identification – e.g. in the case of smartphones via the SIM card).

50 Operators are picking up on this demand by continuously expanding their number of public Wi-Fi hot- and homespots. Orange France, BT and SFR are leading. The French operator Free follows with 3 million Wi-Fi homespots. The operator with the highest density of Wi-Fi spots is the Liberty Global held cableco Ziggo of the Netherlands with 2 million Wi-Fi hot- and homespots: Tefficient, Using public Wi-Fi as customer magnet, Sep 24, 2016, available on: http://media.tefficient.com/2016/09/tefficient-industry-analysis-4-2016-Using-public-Wi-Fi-as-customer-magnet.pdf.

51 In parallel, the import and putting on the market in the EU of routers not capable of being set up as public home hubs should be forbidden, in the absence of voluntary commitments from the manufacturers.

52 As noted by CCG Consulting, Looking Closer at 5G , https://potsandpansbyccg.com/2016/10/03/looking-closer-at-5g/: *"(I)n places with a lot of people, like stadiums, shopping centres or large business buildings, that there will be a migration from Wi-Fi to millimetre wave spectrum using the 5G standard. This very well could ultimately result in gigabit speeds on devices with the right antennas to receive that signal*."

be high enough to encourage traffic to stay on the mobile network instead of being offloaded, so the customer offload percentage may be less than 50 percent.[53]

4.2. Additional consumer protection for Internet access services

Given the importance of the Internet access service as the door to the Information society, the proposed Code imposes several obligations to the Internet Service Providers to protect the end-users. End-users are defined as all natural persons or legal entities not providing electronic communications networks and services, hence include consumers and non-telecom or Internet companies.[54]

4.2.1. Proposal of the Commission

The proposed Code carries forward most of the end-users rights imposed by the current regulatory framework and imposes on the Internet Access Providers obligations on the following issues:

- Transparency: information requirements for contracts and comparison of offers,[55]
- Quality of service, [56]
- Contract duration, termination and facility for switching,[57]
- Equivalent access for disabled users,[58]

Those obligations apply in addition to those foreseen by the Open Internet Regulation, which relates to net neutrality and transparency[59] as well as those foreseen by the general EU consumer acquis.

4.2.2. Critical assessment and Recommendations

Given the importance of IAS in the Information Society and the often little competition for its provision (there is often the choice between only two possible providers), **a strong protection for the consumers, and possibly also for the other end-users, is justified**.

However, given the obligations in the general consumer protection acquis (which protects consumers) and those in the Open Internet regulation (which protects all end-users), the additional obligations of the Code are not justified for the following reasons: (i) first, the net neutrality obligation can already protect in many ways the end-users; (ii) second, as explained in the following section, it would be more effective and coherent to improve the rules and the enforcement of the general consumer protection acquis instead of creating a complex sector-specific end-users protection.

In particular, the information requirement for contracts is already dealt by the Open Internet Regulation laying down measures concerning open internet access which requires strict transparency measures on IAS providers, including that any contract which includes internet access services specifies at least a number of information, such as a clear and comprehensible explanation of the minimum, normally available, maximum and advertised download and upload speed of the internet access services in the case of fixed networks, or of the estimated maximum and advertised download and upload speed of the internet access services in the case of mobile networks.

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[53] CISCO Visual Networking Index (2017), *Global Mobile Data Traffic Forecast: Update 2016-2021*, White Paper, p.17.
[54] Proposed Article 2(14) EECC.
[55] Proposed Articles 95 and 96 EECC.
[56] Proposed Article 97 EECC.
[57] Proposed Articles 98-99 EECC.
[58] Proposed Article 103 EECC.
[59] Articles 3 and 4 Regulation 2015/2120 and BEREC Guidelines of August 2016 on the Implementation by National Regulators of European Net Neutrality Rules, BoR(2016) 127.

In addition, specific safeguards are necessary to facilitate switching between IAS providers (who may be using different physical networks)[60], including allowing consumers to cancel their contract without incurring any costs upon notice of changes in the contractual conditions proposed by the IAS provider[61] and a limitation of the maximum initial contractual commitment period duration.

At the same time, the proposal of the Commission to allow Member States to prohibit minimum commitment periods for IAS shorter than the 24 months[62] does not seem appropriate. The provision of fixed internet access can require substantial installation cost per subscriber. The shorter the period is over which the initial installation cost can be depreciated, the higher the monthly subscription cost will be. Shorter minimum commitment periods can mean higher tariffs. Longer commitment periods could also be an incentive for operators to deploy NGA networks in less dense areas, by offering guaranteed returns.[63] The regulation should balance the interest of certain users (usually not the most vulnerable) in changing providers with the interest of lowering the overall cost of internet access. Moreover, the maximum minimum initial commitment period for fixed and wireless IAS should not be the same.

[60] Proposed Article 99(1) EECC.

[61] Point (k) of the annex to UCTD prohibits terms “enabling the seller or supplier to alter unilaterally without a valid reason any characteristics of the product or service to be provided”, but this prohibition is not operational enough to protect consumers effectively.

[62] Proposed Article 98 EECC.

[63] The exception provided in Article 98 (“This paragraph shall not apply to the duration of an instalment contract where the consumer has agreed in a separate contract to instalment payments for deployment of a physical connection”) is too narrow to incentivize NGA deployment, beyond specific deployment models as the Swedish.

5. INTERPERSONAL COMMUNICATIONS SERVICES

KEY FINDINGS

- Traditional telecommunications services are not (any more) so special and do not require any more extensive sector-specific consumer protection rules. The use of communications OTTs is rapidly growing in the EU indicating consumers' satisfaction. They should not be subject to legacy rules that were justified at the time of traditional telephony but not today. Moreover, the use of telephone numbers justify additional obligations.
- Telecommunications services are global by nature and are instrumental in building the digital single market. Hence, regulatory fragmentation and the application of 28 regulatory frameworks should be avoided.
- In the context of the current review of the EU consumer acquis, rules should be made smarter by better taking into account the numerous consumers' biases and by better integrating consumer protection directly into the computer code ('consumer protection by design').
- Moreover, those general rules should be better enforced at the national level by strengthening the resources and the power of sanction of the consumer protection agencies.

Next to the Internet Access Services, the proposed Code imposes obligations on the three other types of Electronic Communications Services, and in particular on the number-based Interpersonal Communications Services. Some of those obligations are linked to the granting of numbers which is a scarce resources while other aimed to protect the end-users. This section focuses on the latter.

5.1. The proposals of the Commission

One of the most important changes in the proposed Code is the extension of its scope to communications OTTs under the new category of number-independent ICS. Given the importance of those OTTs and their increased substitutability with traditional telecommunications services (the number-based ICS),[64] the Commission felt that it was necessary to allow the NRAs to impose on them obligations related to security, emergency calls and interoperability.

As shown in Table 3, the proposed Code creates different level of regulatory burden for each type of ECS:

- For the number-based ICS, the proposed Code carries forward most of the obligations which are currently applicable to the traditional telecommunications services. A little streamlining has been done to take into account the adoption of horizontal legislations since the last revision of the telecom regulatory framework, in particular the adoption of the Consumer Rights Directive in 2011 and the Network and Security Directive in 2016. In addition, several obligations are specifically linked to the grating of numbers.

[64] As shown in WIK-Consult and TNO (2015), *Over-the-Top (OTT) players: Market dynamics and policy challenges*, Study for the European Parliament; and Ecorys and TNO (2016), F*uture trends and business models in communication services*, Study for the European Commission.

- For the signals conveyance services, the proposed Code carries forward most of the obligations which are currently applicable to the traditional telecommunications services.

- For the number-independent ICS, the proposed Code imposes only one obligation relating to security, which is very close to the obligations already imposed by the NIS directive, and opens the door to two new obligations related to emergency calls and services interoperability.

Table 3: Types of electronic communications services and associated end-user rights[65]

	Sector specific				Horizontal Consumer acquis	Other horizontal rules
		ICS Number based	Signals Conveyance	ICS Number indep		
Transparency Offers and contracts	Art. 95-96 EECC	Y	Y		Art. 5 CRD[66]	
Quality	Art. 97 EECC	Y	Y		SD[67]	
Contract Termination Switching	Art. 98-99 EECC	Y	Y		Art. 8-9 UCPD[68] Point h Annex UCTD[69]	
Out-of-court Dispute resolution	Art. 25 EECC	Y	Y		ADRD[70]	
Emergency calls	Art. 102 EECC	Y		possible		
Inter operability	Art. 59(1c) EECC	Y	Y	possible		
Security	Art. 40 EECC	Y	Y	V		NISD[71]

5.2. Critical assessment and Recommendations

5.2.1. Extension of the regulation to communications OTTs

The extension of the scope of the electronic communications regulatory framework to communications OTTs is proposed because those OTTs are increasingly used by EU consumers and competing with traditional telecommunications services already covered by regulation. As this stage, this extension does not increase much the regulatory burden as OTT services will not be treated in the same way than traditional telecommunications services and will be subject only to the security obligations. However, that may change in the future because the proposed Code opens the door to additional obligations related to emergency calls and services interoperability.

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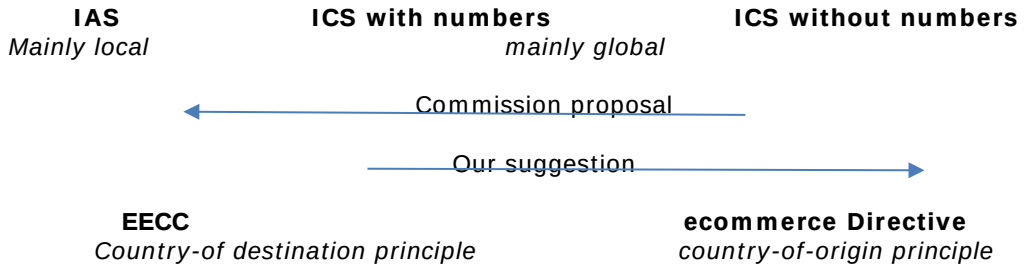
65 This Table is partly based on the WIK-Consult, Cullen International and CRIDS (2016), Substantive issues for review in the areas of market entry, management of scarce resources and general end-user issues, Study for the European Commission, pp. 275-284.
66 Consumer Rights Directive 2011/83.
67 Services Directive 2006/123.
68 Unfair Commercial Practices Directive 2005/29.
69 Unfair Contract Terms Directive 93/13.
70 Alternative Dispute Resolution Directive 2013/11.
71 Network and Information Security Directive 2016/1148.

We think that this extension of scope is problematic and unjustified. It is problematic because communications OTTs are by nature global,[72] hence they are better regulated at the EU level or should benefit from the country-of-origin principle (home-country control). However, the electronic communications regulation framework is based on the principle of country-of-destination.[73] Hence, the risk is now that communications OTTs will be subject to 28 different national regulatory frameworks instead of one as it is currently the case.[74]

Instead of moving the communications OTTs towards the EECC (and its principle of country of destination), it would be better to move the traditional telecommunications services towards the e-commerce Directive (and its principle of country of origin).[75] That would ensure a coherence between the characteristics of the law and of the services and stimulate the digital single market.

Figure 14: Coherence between characteristics of the law and the services



The extension of the ecoms regulation to OTTs also unjustified as its objectives can be achieved with the improvements of general consumer protection rules combined with innovative co-regulatory approaches.

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72 See WIK-Consult and TNO (2015), *Over-the-Top (OTT) players: Market dynamics and policy challenges*, Study for the European Parliament, noting at p. 112: "(…) where European companies seek to gain similar scale to those in the US or other large geographic regions, it makes sense to harmonise rules applying to online services and, to the extent possible, to enforce them across a wide geographic area. Therefore, wherever practicable, rules applying to online service providers should (preferably) be fully harmonised at EU level. A European authority or co-ordination body might in some cases be justified. Wherever full harmonisation would not be possible, efforts should be made to pursue the country of origin principle".

73 This is justified for digital network infrastructures that are mainly local but not for digital services.

74 For example, which the 'competent authority' to which security breaches would have to be reported under the proposed Electronic Communications Code? Under Article 12(2) of the Commission proposal, number-independent OTTs would not need to operate under the general authorization regime for electronic communications services and would not be required to make a declaration to national regulatory authorities of all Member States in which they are active. This means that if the Commission proposal is adopted, OTTs would have to notify security breaches to the authorities of all Member States in which their service is potentially available, including possibly translating their notification into all national languages. The extension of the Framework's obligations to global OTTs will necessarily lead to problem of international jurisdiction. For example, millions of Chinese tourists and businesspeople in the EU communicate through the cross-platform instant messaging service developed by Tencent, WeChat. In case a security breach occurs somewhere in China, should WeChat report to all EU Member States? Moreover, instant message platforms are in constant evolution and now allow 'apps within the app'. For example, WeChat contains apps allowing paying bills, order goods and services, send money to other users, and pay in stores. If an app is implemented within WeChat allowing users – including when staying in the EU - to call subscribers of the Chinese fixed (or mobile) telephone networks, would we WeChat then suddenly become a number based personal communications service subject to all national rules adopted in the EU under the Commission proposal?

75 A. de Streel and P. Larouche (2016), *An Integrated Regulatory Framework for Digital Networks and Services*, CERRE Policy Report, p. 35. To ensure that the removal of the traditional telecommunications services from the sector-specific regulation does not undermine consumer protection this reform should be coupled with an improvement of the rules and enforcement of the horizontal consumer acquis as we show in the following section.

5.2.2. A smarter way to distribute obligations

a. Horizontal consumer protection rules

Many of the obligations contained in the proposed EECC are already covered by the EU horizontal consumer protection, albeit in a less detailed manner and only for consumers and not the other end-users (mainly firms which are not electronic communications providers). [76]

Instead of relying on sector-specific detailed rules which run the risks of incoherence with horizontal rules, of creating confusion among consumers and firms and of being quickly outdated by technology and market evolutions, **it would be more effective and coherent to rely on improved general consumer protection rules**. The forthcoming review of the EU consumer acquis gives the opportunity to follow such approach.

The first improvement is *at the substantive level* and aims at making the horizontal rules smarter. One avenue for progress is **better take into account the insights of the behavioural studies highlighting the numerous biases in consumers' behaviours**.[77]

An obvious example is the information overload, sometimes strategically manufactured by the operators, sometimes imposed by the law. Many recent studies show that consumers will not, and often cannot, read long and complicated terms of use.[78] It is more important that they receive only the key information on which they will base their choices in an understandable format and at the moment when they make the choices. Therefore, the proposal of the EECC to impose summary contracts whose format will be designed by the regulators,[79] may be a step in the right direction. However, they should not be limited to the telecom sector but foreseen in the horizontal rules.

Moreover, with the rapid development of artificial intelligence personal assistant, consumption choices will be not be made by the consumer herself but by her algorithm. In this case, the problem will no longer be the information overload but machine readability of the information and neutrality of the algorithm.

Another avenue for progress consists **in integrating consumer protection directly into the technological design** and use the computer code, in complement with the legislative code, to protect consumers.[80] This approach is now applied for privacy with the "privacy by design" obligation enshrined in the GDPR.[81]

A second improvement to the horizontal consumer protection rules is at the *enforcement level*. In several Member States, many consumer protection rules are poorly enforced and cause customer complaints and un-satisfaction. To remedy those situations, policy makers are often changing rules. They make them more detailed, more complex and more sector specific, possibly leading to even poorer enforcement.

To alleviate this vicious circle, it is better to keep the rules general, so they can adapt to rapid technology and market evolutions, but dedicate sufficient resources to effective

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[76] See also WIK-Consult, Cullen International and CRIDS (2016), *Substantive issues for review in the areas of market entry, management of scarce resources and general end-user issues*, Study for the European Commission, pp. 275-284.

[77] Those biases have been summarised in 2011 by the Economics Nobel-prize winner D. Kahneman in his seminal textbook *Thinking Fast and Slow*, Penguin.

[78] Ecorys et al. (2016), *Consumers' attitudes towards Terms and Conditions*, Study for the European Commission; Norwegian Consumer Protection Agency (2016), *APPFAIL: Threats to Consumers in Mobile Apps;* Bakos Y., Marotta-Wurgler F. and D.R. Trossen (2014), "Does Anyone Read the Fine Print? Consumer Attention to Standard-Form Contracts", *Journal of Legal Studies*, 43(1), 1-35.

[79] Proposed Article 95(5) EECC.

[80] One of the first author to have developed the idea of using the IT code as a regulatory tool is Lawrence Lessig in his seminal book, *Code and Other Laws of the Cyberspace – Version 2.0*, Basic Book.

[81] The concept was originated by a Resolution on Privacy by Design adopted at the 32nd International Conference of Data Protection and Privacy Commissioners in October 2010.

enforcement while giving enforcers enough sanctioning powers.[82] Those strengthened consumer protection agencies could adopt, on the basis of general rules, more specific guidelines to increase the certainty and the deterrence of the law.[83] In addition, those agencies could set-up, with the industry and consumer associations, multi-stakeholders forums to develop code of good practices and other co-regulatory instruments.[84]

b. Horizontal Security rules

As for consumer protection, most of the security obligations proposed in the EECC are already covered by the recently adopted NIS Directive, albeit in a more general manner. Again, it may be **more effective to strengthen the enforcement mechanism of the NIS Directive instead of adopting more detailed sector-specific security obligations**.

c. Specific rules linked to phone numbers

Most of the obligations proposed for number-based ICS relate to the use telephone numbers (in the format specified in ITU-T Recommendation E.164). Telephone numbers today, and likely in the foreseeable future, have a very important status as a function for universal accessibility. Its network effects are not matched by any other addressing function for individuals. This justifies that services that use phone numbers are subject to specific regulation such as for number portability, interconnection and access to 112.

However, **imposing such rules does not require a distinct legal category. Regulatory obligations can be imposed as a counterpart for making use of numbering resources**, as conditions for the allocation (authorisation) of E.164 telephony numbers. In other words, the rules on, inter alia, number portability, telephony interconnection and 112 would only follow from the terms of the individual number allocation decision.[85] This could be combined with a review of who could be assigned telephone numbers or what criteria need to be fulfilled in order for someone to be assigned such numbers. These criteria may need to be different depending on how the numbers will be used.

d. Emergency calls

The Commission proposal carries over the obligations relating to the single European emergency telephone number 112.[86]

First, a major 112 emergency call application – the automated eCall system – remains the subject of instruments, which are not consolidated into the proposed EECC. The accessibility of the EU legislation would be improved if the latter instruments could be consolidated in the Code.

Second, the Commission proposal overlooks that smartphone penetration has overtaken that of other mobile phones. A dial pad will no longer be required to initiate emergency calls. ECall will enable setting up emergency calls by pushing a red button.

Further lives could be saved if, instead of having to seek for the dialpad on the smartphone screen and then dial three digits, the **EECC would require that all smartphones in the EU would include an emergency app**[87]**, to be further developed by the sector**[88] in

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[82] A. de Streel and P. Larouche (2016), *An Integrated Regulatory Framework for Digital Networks and Services*, A CERRE Policy Report, p. 42.

[83] As applied for instance for competition law.

[84] See for instance, WIK-Consult (2015), *Review of the Open Internet Codes*, Report for the Broadband Stakeholder Group.

[85] Also in that direction: Swedish Department of Enterprise and Innovation, *Non-paper of 7 December 2015 on the review of the regulatory framework for electronic communications*.

[86] Proposed Article 102 EECC.

[87] In Australia, emergency services, the Government and industry partners developed the app 'Emergency +', available on https://play.google.com/store/apps/details?id=com.threesixtyentertainment.nesn&hl=en

[88] In the USA, MIT researchers developed such an app. See. The app that could save your LIFE: Emergency service tells rescuers HOW to find and save you at the touch of a button, MailOnline, 2 April 2015, available

agreement with the European Commission. Such app would, as the eCall system, activate Advanced Mobile Location (AML) positioning and should, in addition, enable callers to include pictures or videos, which would be forwarded to the 'Public Safety Answering Points' as defined under the eCall Regulation.[89] The app should also ensure that when the user has no signal on its network, calls are routed through available Wi-Fi networks. Once connected, the caller would not have to speak, given that the information would be sent automatically.

Moreover, the Commission proposal carries over[90] the obligation for the Member States to take all necessary measures to ensure the fullest possible availability of publicly available telephone services provided over public communications networks in the event of catastrophic network breakdown or in cases of force majeure. However, this provision should include access to available Wi-Fi hot or homespots. After the terrorist attack in the Brussels in March 2016, the main Belgian mobile networks ceased functioning in Brussels.[91]

e. The issue of interoperability

The existing provisions regarding interoperability were designed for vertically integrated providers of telecom infrastructure. They were providing (managed) services over their networks and controlled subscribers, who could only be reached through that operator. Call termination on the fixed and mobile telephone networks are bottlenecks and that is the reason why regulation of the telephone service was (and likely still is) required.

On the other hand, over-the-top (OTT) services are online services which do not have necessarily control over their subscribers. Online services allow 'multi-homing'.[92] End-user can download different apps on her smartphone and call or be called on any of them. Moreover, the success of OTT services came because they empowered consumers: they provided not only lower prices and more functionalities, but also allow instantaneous switching. The consumer does even not need deleting the app from her smartphone. She merely can use other, competing apps. In such context, interoperability obligations on apps is much less justified.

on:http://www.dailymail.co.uk/sciencetech/article-3023155/The-app-save-LIFE-Emergency-service-tells-rescuers-save-touch-button.html#ixzz4TIpI3WbD

89 Regulation 2015/758 of 29 April 2015 concerning type-approval requirements for the deployment of the eCall in-vehicle system based on the 112 service and amending Directive 2007/46/EC

90 Proposed Article 101 EECC.

91 The only alternative were the homespot networks from the fixed operators. The cable operator Telenet took immediately the initiative to open its public home spots for anyone. They were soon followed by the telecommunications operator Proximus and the cable operator VOO.

92 This have even been recognised by the General Court of the EU when it upheld the Commission approval of the acquisition of Skype by Microsoft: Case T-79/12, *Cisco and Messagnet v. Commission*, ECLI:EU:T:2013:635, para 79 et sq.

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ANNEX 1: CISCO GLOBAL IP TRAFFIC FORECAST

This Table shows a summary of the Cisco global IP traffic forecast.

IP Traffic, 2015–2020							
	2015	2016	2017	2018	2019	2020	CAGR (2015–2020)
By Type (Petabytes [PB] per Month)							
Fixed Internet	49,494	60,160	73,300	89,012	108,102	130,758	21%
Managed IP	19,342	22,378	25,303	28,155	30,750	33,052	11%
Mobile data	3,685	6,180	9,931	14,934	21,708	30,564	53%
By Segment (PB per Month)							
Consumer	58,539	72,320	89,306	109,371	133,521	162,209	23%
Business	13,982	16,399	19,227	22,729	27,040	32,165	18%
By Geography (PB per Month)							
Asia Pacific	24,827	30,147	36,957	45,357	55,523	67,850	22%
North America	24,759	30,317	36,526	43,482	50,838	59,088	19%
Western Europe	11,299	13,631	16,408	19,535	23,536	27,960	20%
Central and Eastern Europe	5,205	6,434	8,116	10,298	13,375	17,020	27%
Latin America	4,500	5,491	6,705	8,050	9,625	11,591	21%
Middle East and Africa	1,930	2,698	3,822	5,380	7,663	10,865	41%
Total (PB per Month)							
Total IP traffic	72,521	88,719	108,533	132,101	160,561	194,374	22%

ANNEX 2: LEGAL CATEGORIES AND DEFINITIONS

Electronic communications network: transmission systems, whether or not based on a permanent infrastructure or centralised administration capacity, and, where applicable, switching or routing equipment and other resources, including network elements which are not active, which permit the conveyance of signals by wire, radio, optical or other electromagnetic means, including satellite networks, fixed (circuit- and packet-switched, including Internet) and mobile terrestrial networks, electricity cable systems, to the extent that they are used for the purpose of transmitting signals, networks used for radio and television broadcasting, and cable television networks, irrespective of the type of information conveyed *(proposed Art. 2(1) EECC)*.

Very high capacity network: an electronic communications network which either consists wholly of optical fibre elements at least up to the distribution point at the serving location or which is capable of delivering under usual peak-time conditions similar network performance in terms of available down- and uplink bandwidth, resilience, error-related parameters, and latency and its variation. Network performance can be considered similar regardless of whether the end-user experience varies due to the inherently different characteristics of the medium by which the network ultimately connects with the network termination point *(proposed Art. 2(2) EECC)*.

Electronic communications service: a service normally provided for remuneration via electronic communications networks, which encompasses:

- 'internet access service' as defined in Article 2(2) of Regulation (EU) 2015/2120;
- and/or 'interpersonal communications service';
- and/or services consisting wholly or mainly in the conveyance of signals such as transmission services used for the provision of machine-to-machine services and for broadcasting, but excludes services providing, or exercising editorial control over, content transmitted using electronic communications networks and services *(proposed Art. 2(4) EECC)*.

Internet access service: a publicly available electronic communications service that provides access to the internet, and thereby connectivity to virtually all end points of the internet, irrespective of the network technology and terminal equipment used *(Article 2(2) Regulation 2015/2120)*.

Interpersonal communications service: a service normally provided for remuneration that enables direct interpersonal and interactive exchange of information via electronic communications networks between a finite number of persons, whereby the persons initiating or participating in the communication determine its recipient(s); it does not include services which enable interpersonal and interactive communication merely as a minor ancillary feature that is intrinsically linked to another service *(proposed Art. 2(5) EECC).*

Number-based interpersonal communications service: an interpersonal communications service which connects with the public switched telephone network, either by means of assigned numbering resources, i.e. a number or numbers in national or international telephone numbering plans, or by enabling communication with a number or numbers in national or international telephone numbering plans *(proposed Art. 2(6) EECC).*

Number-independent interpersonal communications service: an interpersonal communications service which does not connect with the public switched telephone network, either by means of assigned numbering resources, i.e. a number or numbers in national or international telephone numbering plans, or by enabling communication with a number or numbers in national or international telephone numbering plans *(proposed Art. 2(7) EECC)*

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